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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,291	02/12/2004	Youichi Ohsawa	0171-1046P	2846

2292 7590 06/16/2005

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
CHU, JOHN S Y	

ART UNIT	PAPER NUMBER
1752	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/776,291	OHSAWA ET AL.	
	Examiner	Art Unit	
	John S. Chu	1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to the amendment filed March 14, 2005.

1. The rejection over claims 1, 3-15 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4-15 of U.S. Patent No. 6,689,530 is **withdrawn** in view of the filed Terminal Disclaimer submitted by applicant.

2. The rejection over claims 1, 3-15 as provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,3,5,7,9-18 of copending Application No. 10/636,541 is **withdrawn** in view of the proper Terminal Disclaimer submitted by applicant.

3. The rejection over claims 1, 3-15 as provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4-15 of U.S. Patent application publication 2004/0167322 is **withdrawn** in view of the proper Terminal Disclaimer submitted by applicant.

Claim Rejections - 35 USC § 103

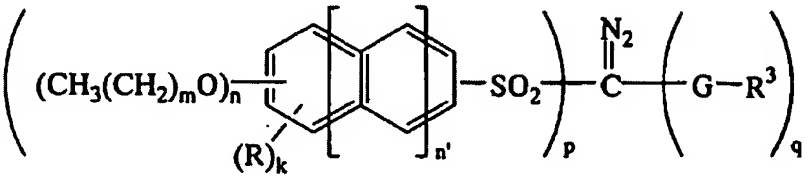
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over OHSAWA et al (6,689,530).

The claimed invention is drawn to the following:

1. A sulfonyldiazomethane compound having the following general formula (1):

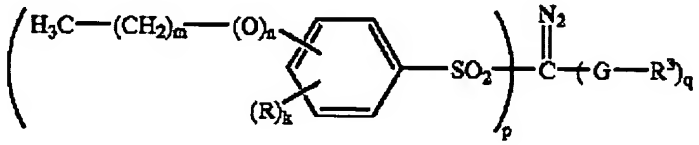


(1)

wherein R is independently hydrogen or a substituted or unsubstituted straight, branched or cyclic alkyl or alkoxy group of 1 to 4 carbon atoms, G is SO_2 or CO, R^3 is a substituted or unsubstituted straight, branched or cyclic alkyl group of 1 to 10 carbon atoms or a substituted or unsubstituted aryl group of 6 to 14 carbon atoms, p is 1 or 2, q is 0 or 1, satisfying p+q = 2, n is 2 or 3, n' is 0 or 1, m is independently an integer of 3 to 11, and k is an integer of 0 to 4.

OHSAWA et al '530 discloses a sulfonyl diazomethane photoacid generator and their use in resist compositions and pattern processing. Applicants are directed to the chemical structure found in column 8, lines 20-25 seen below:

(1)

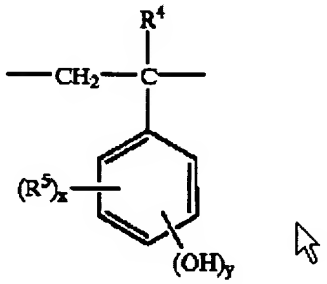


The compound discloses that R can among others be an alkoxy group of 1 to 4 carbon atoms, i.e. methoxy, ethoxy, propoxy and butoxy. This disclosure teaches the skilled artisan that the sulfonyl diazomethane compounds can contain two alkoxy groups on the aromatic ring, thus

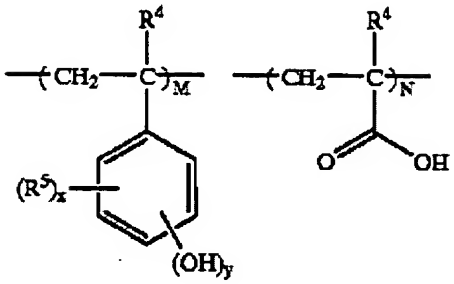
meeting the recited sulfonyl diazomethane compound of claim 1 when n= 2 or 3 and n' = 0 and m=3.

Applicants are further directed to column 15, line 26 – column 16, line 5 where the resist composition may be either positive or negative working and can contain additional ingredients, such as a second acid generator resist (2), a basic compound (resist 3), an organic acid (resist 4), etc. More specifically the second photoacid generating compounds are disclosed in column 28, line 30 – column 33, line 34 with the more preferred photoacid generators disclosed in column 33, lines 12-34 such as sulfonium salts, bis sulfonyldiazomethanes, and N-sulfonyloxyimides. The especially preferred alkali-soluble resins include copolymer of hydroxystyrene as seen below:

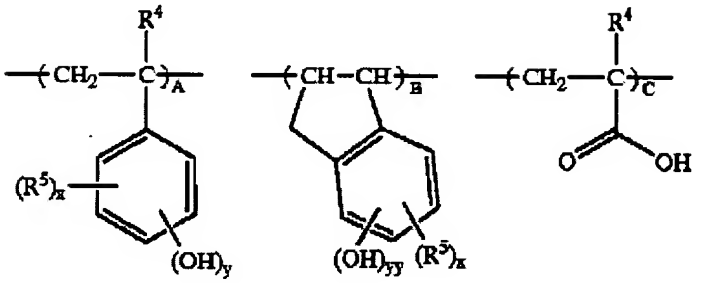
(2)



(2')



(2")



Claimed Component D to the additive basic compound is found in column 34, line 7 – column 39, lines 25. The only preferred property for the basic compounds is to have them suppress the rate of diffusion when the acid generated by the photoacid diffuses within the resist film. For the claimed organic acid derivative recited in claim 13, applicants are directed to column 39, lines 26 – 55 wherein salicylic acid and 4,4-bis(4'-hydroxyphenyl)valeric acid are preferred. Column 39, line 55 – column 40, line 43 disclose the organic solvents preferred which include propylene glycol alkyl ether acetates and alkyl lactates are preferred. And finally

the method is disclosed in column 58, lines 44 – 53 wherein a coated wafer is spin-coated, dried, baked, exposed to an excimer laser and developed in 2.38% TMAH.

OHSAWA et al lacks a working example with a sulfonyl diazomethane having two alkoxy groups on the aromatic ring.

It would have been *prima facie* obvious to one of ordinary skill in the art of photosensitive resist compositions to select the R group in the compound of OHSAWA et al '530 to be an alkoxy having 4 carbon atoms, i.e. butoxy and thus have a compound which can be used as a photoacid generating compound in a photoresist and reasonably expect same or similar results with respect to improved resolution, pattern profile and deep UV sensitivity as recited in the OHSAWA et al '530.

It also would have been *prima facie* obvious to one of ordinary skill in the art of photosensitive resist compositions to add any of the ingredients as disclosed in OHSAWA et al '530 to the resist composition such as a basic compound, an organic acid derivative and the disclosed organic solvents in OHSAWA et al '350 and still reasonably expect the improved properties disclosed OHSAWA et al '530.

6. Claims 1 and 3-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over OHSAWA et al '2004/0033432.

The claimed invention has been recited above and is included by reference.

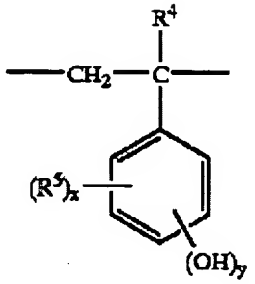
OHSAWA et al '432 discloses a sulfonyl diazomethane photoacid generator and their use in resist compositions and patterning processing. The sulfonyl diazomethane are disclosed on page 4, subparagraphs [0042] – [0047]. The preferred R groups are disclosed in subparagraph [0047] to include hydrogen, methyl, n-butyloxy, sec-butyloxy, iso-butyloxy and tert-butyloxy,

however, hydrogen, methyl, ethyl, n-propyl, and isopropyl are preferred with hydrogen and methyl most preferred. Thus applicants though not specifically directed to two alkoxy groups as claimed, they are taught that alkoxy groups are suitable for the photoresist compositions.

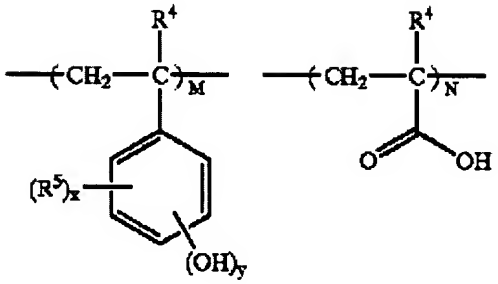
The components of the resist composition are found on page 7, lines [0074] – [0085] wherein each of the additive components recited in the dependent claims are taught.

The alkali-soluble resins which are preferred are disclosed on page 8, subparagraph [0092] as seen here below which meet the claimed :

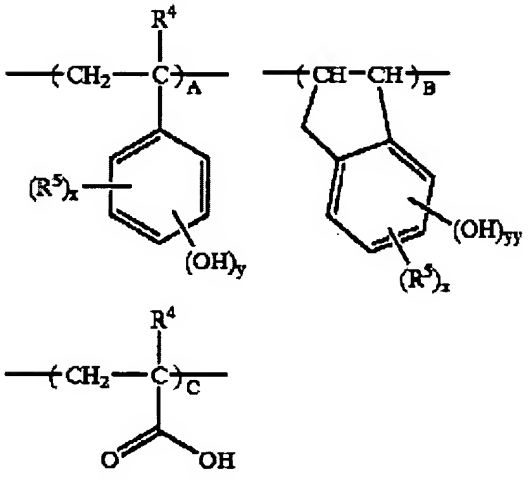
(2)



(2')



(2")



Claimed Component C to a second photoacid generator is found on page 13, subparagraph [0139] – [0158], while claimed Component D to the additive basic compound is found in subparagraph [0159] – [0175]. The only preferred property for the basic compounds is to have them suppress the rate of diffusion when the acid generated by the photoacid diffuses within the resist film. For the claimed component (E) to an organic acid derivative recited in

claim 13, applicants are directed to page 19, subparagraph [0177] wherein salicylic acid and 4,4-bis(4'-hydroxyphenyl)valeric acid are preferred. Page 19, subparagraph [0179] disclose the organic solvents preferred which include propylene glycol alkyl ether acetates and alkyl lactates. And finally the claimed process of claim 15 is disclosed in Page 23, subparagraph [0205] – [0206] wherein a coated wafer is spin-coated, dried, baked, exposed to an excimer laser and developed in 2.38% TMAH.

OHSAWA et al lacks an working example with a sulfonyl diazomethane having two alkoxy groups on the aromatic ring.

It would have been *prima facie* obvious to one of ordinary skill in the art of photosensitive resist compositions to select the R group in the compound of OHSAWA et al '432 to be an alkoxy having 4 carbon atoms, i.e. butoxy and thus have a compound which can be used as a photoacid generating compound in a photoresist and reasonably expect same or similar results with respect to improved resolution, pattern profile and deep UV sensitivity as recited in the OHSAWA et al '432.

It also would have been *prima facie* obvious to one of ordinary skill in the art of photosensitive resist compositions to add any of the ingredients as disclosed in OHSAWA et al '530 to the resist composition such as a basic compound, an organic acid derivative and the disclosed organic solvents in OHSAWA et al '350 and still reasonably expect the improved properties disclosed OHSAWA et al '530.

7. No 35 U.S.C. 102(e) rejection over OHSAWA et al '530 or '432 was made in view of the fact that the prior art references failed to have a disclosure which anticipated the claimed sulfonyldiazomethane having two or three alkoxy groups on the aromatic ring. A second alkoxy

group is suggested as a definition for R, but does not rise to level of anticipation under 35 U.S.C. 102.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

The fax phone number for the USPTO is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John S. Chu
Primary Examiner, Group 1700

J.Chu
June 6, 2005